

Claims:

1. A method for monitoring a network containing routers using a backup routing protocol and organized in at least one backup router group, comprising:
 - discovering a topology object model of the routers;
 - detecting a condition of the at least one backup router group based on at least one threshold value; and
 - displaying an indication of the detected condition.
2. The method of Claim 1, wherein the at least one threshold value includes a minimum number of available routers in a backup router group.
3. The method of Claim 1, wherein the detecting is also based on a number of backup router groups to which one of the routers belongs.
4. The method of Claim 1, wherein for each backup router group the topology object model comprises:
 - at least one network router node;
 - at least one network interface for each at least one network router node;
 - at least one address for each at least one network interface;
 - a state of each one of the at least one address that is internal to the backup router group; and
 - any tracked interfaces associated with each one of the at least one address that is internal to the backup router group.
5. The method of Claim 4, wherein the topology object model comprises:
 - a state of at least one of the at least one address that is external to the backup router group.

6. The method of Claim 1, wherein the detecting is also based on a state of at least one of the at least one address that is external to the backup router group.

7. The method of Claim 1, wherein the condition is a minimum number of functional routers available in a corresponding backup router group.

8. The method of Claim 1, wherein the condition is a minimum number of functional routers available only in a corresponding backup router group.

9. The method of Claim 1, comprising:
receiving status information from the routers; and
updating the topology object model to reflect the received status information.

10. The method of Claim 9, wherein the status information includes states associated with interface addresses within the at least one backup router group.

11. The method of Claim 10, wherein the status information includes status of tracked interfaces associated with routers organized in the at least one backup router group.

12. A system for monitoring a network containing routers using a backup routing protocol and organized in at least one backup router group, comprising:
means for discovering a topology object model of the routers and detecting a condition of the at least one backup router group based on at least one threshold value; and
means for displaying an indication of the detected condition.

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13. The system of Claim 12, wherein the at least one threshold value includes a minimum number of available routers in a backup router group.

14. The system of Claim 12, wherein the detecting is also based on a number of backup router groups to which one of the routers belongs.

15. The system of Claim 12, wherein for each backup router group the topology object model comprises:

- at least one network router node;
- at least one network interface for each at least one network router node;
- at least one address for each at least one network interface;
- a state of each one of the at least one address that is internal to the backup router group; and
- any tracked interfaces associated with each one of the at least one address that is internal to the backup router group.

16. The system of Claim 15, wherein the topology object model comprises:
a state of at least one of the at least one address that is external to the backup router group.

17. The system of Claim 12, wherein the detecting is also based on a state of at least one of the at least one address that is external to the backup router group.

18. The system of Claim 12, wherein the condition is a minimum number of functional routers available in a corresponding backup router group.

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19. The system of Claim 12, wherein the condition is a minimum number of functional routers available only in a corresponding backup router group.

20. The system of Claim 12, comprising:
means for receiving status information from the routers and for updating the topology object model to reflect the received status information.

21. The system of Claim 20, wherein the status information includes states associated with interface addresses within the at least one backup router group.

22. The system of Claim 21, wherein the status information includes status of tracked interfaces associated with routers organized in the at least one backup router group.

23. The system of Claim 12, wherein:
the means for discovering also receives status information from the routers and updates the topology object model to reflect the received status information.

24. A machine readable medium comprising a computer program for causing a computer to perform:
discovering a topology object model of the routers;
detecting a condition of the at least one backup router group based on at least one threshold value; and
displaying an indication of the detected condition.

25. The medium of Claim 24, wherein the at least one threshold value includes a minimum number of available routers in a backup router group.

26. The medium of Claim 24, wherein the detecting is also based on a number of backup router groups to which one of the routers belongs.

27. The medium of Claim 24, wherein for each backup router group the topology object model comprises:

- at least one network router node;
- at least one network interface for each at least one network router node;
- at least one address for each at least one network interface;
- a state of each one of the at least one address that is internal to the backup router group; and
- any tracked interfaces associated with each one of the at least one address that is internal to the backup router group.

28. The medium of Claim 27, wherein the topology object model comprises:

- a state of at least one of the at least one address that is external to the backup router group.

29. The medium of Claim 24, wherein the detecting is also based on a state of at least one of the at least one address that is external to the backup router group.

30. The medium of Claim 24, wherein the condition is a minimum number of functional routers available in a corresponding backup router group.

31. The medium of Claim 24, wherein the condition is a minimum number of functional routers available only in a corresponding backup router group.

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32. The medium of Claim 24, wherein the computer program causes the computer to perform:

receiving status information from the routers; and
updating the topology object model to reflect the received status information.

33. The medium of Claim 32, wherein the status information includes states associated with interface addresses within the at least one backup router group.

34. The medium of claim 33, wherein the status information includes status of tracked interfaces associated with routers organized in the at least one backup router group.

35. A data structure for representing a backup routing protocol topology object model for a network, the data structure comprising:

at least one network node object representing an element in the network;
at least one network interface object for each at least one network node object, the at least one network interface object representing an interface of the network element corresponding to the each at least one network node object;

an address object for each at least one network interface object, representing an address of the corresponding interface;

a backup routing protocol group object representing network elements organized in a backup routing protocol group, the backup routing protocol group object including a virtual address of the backup routing protocol group and real addresses of the network elements in the backup routing protocol group; and

an address state object for each of the real addresses of the network elements in the backup routing protocol group, including a state of the corresponding address.

36. The data structure of Claim 35, comprising:

a track interface object corresponding to a tracked network interface of a first network element in the backup routing protocol group wherein the tracked network interface is located between the first network element and a network element outside the backup routing protocol group.

37. The data structure of Claim 35, wherein:

the backup routing protocol group can be related to many network node objects;

the backup routing protocol group can be related to many address objects;

each network node object can be related to many backup routing protocol group objects;

each network node object can be related to many network interface objects;

each network interface object can be related to many address objects; and

each address object can be related to many network interface objects.